

BOTANICAL SOCIETY OF AMERICA.

THE third annual meeting of this society, held in the Biological Building of the University of Toronto, on Tuesday and Wednesday, August 17 and 18, 1897, was in many ways the most successful meeting which this young but vigorous organization has had. The attendance, although not large by reason of the absence of a number of members in Europe or the far west, was representative of Canada and states from New York to Nebraska; and the papers read touched almost every great department of botany except phytogeography. An inspection of the titles given below shows that teratology, physiology, morphology, cytology, histology, taxonomy, and bibliography were all under consideration. The open sessions on Wednesday for the reading of papers were attended by a considerable number of professional botanists from England, Canada, and the United States who expressed much interest and took part in the proceedings. As foreign associate members (for this meeting only) there were present Professor H. Marshall Ward, Professor F. O. Bower, Mr. Harold Wager, Mr. J. Bretland Farmer, and Mr. J. Reynolds Green.

The business meeting of the society was held on Tuesday afternoon at 3:00, following the meeting of the council in the Queen's Hotel at 1:30. The council reported that the mail ballots received had been opened and canvassed, and announced the election of the following officers for 1898: *President*, NATHANIEL L. BRITTON; *Vice president*, JOSEPH C. ARTHUR; *Secretary*, CHARLES R. BARNES; *Treasurer*, ARTHUR HOLLICK; *Councilors*, BENJAMIN L. ROBINSON and FREDERICK V. COVILLE.

The council, after careful consideration of the invitation of the director and trustees of the Missouri Botanical Garden to hold a spring meeting of the society in St. Louis as their guests, felt constrained to recommend that the invitation be regretfully

declined at present. The semi-centennial meeting of the A. A. A. S., which is to be held in Boston next year, seems to make it imperative for the society to meet there in August in furtherance of its plan to cooperate with the general association as fully as possible, and the close occupation of the members of the society renders two meetings a year impracticable. In this recommendation the society fully concurred.

Other formal invitations from Omaha, Tampa, and Old Point Comfort were read, and the secretary was directed to send suitable replies conveying the thanks of the society for the invitations.

The proposition to amend the constitution so as to reduce the entrance and annual dues from \$25 and \$10, respectively, to \$10 and \$5 met with no favor. Communications to the secretary from members who could not be present, and the adverse opinions expressed at the meeting promptly determined the fate of the amendment. It was laid upon the table.

There was also before the society the proposal to establish one or two medals to be given at intervals for valuable research. The discussion of this topic showed the sentiment of the members to be rather in favor of allowing the funds of the society to accumulate until the interest is sufficient to be used in the promotion of research by the maintenance of a table at one of the biological stations. The proposition for establishment of a medal was therefore laid upon the table.

The programme of papers for Wednesday was announced. The action of the council in inviting Mr. H. J. Webber to address the society upon his recent researches upon *Zamia*, and Drs MacDougal and Campbell to report their observations upon Jamaica as a site for a tropical laboratory, was approved.

On the second day at an executive session the following were elected active members: Bradley Moore Davis, of the University of Chicago; Sir John William Dawson, of Montreal; James Ellis Humphrey, of Johns Hopkins University; Daniel Trembley MacDougal, of the University of Minnesota; Frederick C. Newcombe, of the University of Michigan; Henry

Hurd Rusby, of the New York College of Pharmacy; Harry Luman Russell, of the University of Wisconsin; Joseph Newton Rose, of the United States National Museum; Walter Tennyson Swingle, of the Division of Physiology and Pathology, U. S. Department of Agriculture.

The address of the retiring president was delivered on Tuesday evening by Professor Dr. Charles E. Bessey, on "The phylogeny and taxonomy of angiosperms." It is printed in full elsewhere in this number.

The following papers were read on Wednesday:

B. L. ROBINSON: *A case of ecblastesis and axial proliferation in *Lepidium apetalum**. 10 min. (Published in full in this number.)

J. C. ARTHUR: *Movement of protoplasm in cænocytic hyphæ*. 45 min.

The movement was first seen by the author in 1890, and has since been studied in eight species of Mucoraceæ. It resembles, but is not quite so rapid as the movement long known in the slime molds. The movement is best seen when the fungus is growing in a very moist atmosphere. The contents of the filament, including the large and numerous vacuoles, flow in a surging stream through the principal branches, more commonly toward the growing ends of the hyphæ and the forming sporangia. But the movement is inconstant, and is often reversed, or brought to a standstill, without any regularity. The author believes that the movement is due to the osmotic absorption of water in one part and the extravasation of water in a distant part. When the filaments are turgid this change of water content displaces the whole liquid mass from the place of greater tension toward that of lesser tension, producing a more or less uniform movement. The living protoplasm is, however, credited with being the exciting and controlling agent.

JOHN M. COULTER: *Pollen grains and antipodal cells*. 30 min.

Attention was called to the current views concerning the homologies of the pollen grain structures, and special objection

was made to the view which regards the pollen tube as the representative of the male prothallium. The recent discovery (in the author's laboratory) of the occasional occurrence of a small lenticular cell, cut off before the usual divisions of the microspore nucleus, and also of the occasional direct division of the "vegetative" nucleus, suggest again the older homologies. Comparison with the corresponding structures of heterosporous pteridophytes suggests that the occasional lenticular cell cut off in the germinating pollen grain represents the "prothallial" cell which constantly appears in the former, and that the pollen grain as a whole, with the exception of this occasional cell, represents the single antheridium of the heterosporous pteridophytes. According to this view the "vegetative" nucleus, with its cytoplasmic organization, represents the antheridium wall, from which the pollen tube is an outgrowth. The so-called "male cells" would thus represent the spermatozoid mother cells of the heterosporous pteridophytes.

In connection with the antipodal cells attention was called to the fact that they represent the most variable region of the embryo sac in dicotyledons, in which four types of antipodal development were noted: (1) a group of evanescent cells, usually three in number, characteristic of Amentiferæ and their allies; (2) three large antipodal cells, increasing in size with the sac, apparently very active, and usually becoming multinucleate, characteristic of Ranunculaceæ and their allies; (3) usually three comparatively permanent cells, not notable in size or activity, rather common among Sympetalæ; (4) an indefinite number of cells, forming a relatively permanent and very prominent tissue, often continuing its growth downward and breaking through the bottom of the sac, very characteristic of certain sections of the Compositæ.

FREDERIC E. CLEMENTS: *The transition region of the Caryophyllales.* 30 min. Presented by CHARLES E. BESSEY.

The history of the investigation of the transition region was discussed at considerable length. After a concise sketch of the histogenetic changes in the transition region in general, the

details of the process were given for selected genera, *Dianthus*, *Portulaca*, *Allionia*, *Phytolacca*, *Polygonum*, and *Rumex*. The author's résumé is as follows: Three types of transition may be distinguished with respect to the constitution of the bundle trace of the cotyledons; holostelar, where the trace is composed of the entire vascular system of the hypocotyledonary stele; prototracheidal, when the prototracheids are the xylem elements to pass into the cotyledons; metatracheidal, when the cotyledonary trace is formed by the metatracheids. With reference to the perfection of the transition in the hypocotyl, the transition may be truncate, or complete. In the first case, the xylem and phloem reach the cotyledons in centripetal, or secantial orientation; in the second, the orientation is centrifugal, and the stele becomes collateral.

D. P. PENHALLOW: *A revision of the species of Picea occurring in northeastern America.* 25 min.

The author reviewed the relations of the spruces of northeastern America with special reference to the possible separation of the red spruce as a distinct species. In 1887 the late Dr. George Lawson advocated the separation of the red from the black spruce with which it has been merged for the last seventy years, or since the time of Pursh. A critical study of authentic material, both in the field and in the laboratory, leads to the conclusion that the red spruce possesses well defined specific characters which separate it from all others. This evidence is derived primarily from the cones and leaves, but is supported by data derived from the internal structure of the stem. It is also highly probable that there may be another, and heretofore unrecognized variety or species of spruce closely allied to the black spruce, but further study in this direction is needed.

The author also recognizes a well defined variety of the white spruce, locally known as the cat or skunk spruce, for which he proposes the name *fœtida* in allusion to its characteristic odor.

EDWARD LEE GREENE: *Bibliographic difficulties.* 30 min.

The author cited numerous instances of the complexity of

the so-called species of Linnæus, and consequent impossibility of determining to which of the segregates a given specific name ought to be applied. Thus, out of the *Viola palmata* of that author, or, at least, out of plants all answering about equally well to his brief and vague diagnosis, no less than five thoroughly distinct segregate species are recognized by botanists who know the east American violets. Meanwhile it is certain that even the synonyms by Gronovius and Plukenet, adduced by Linnæus as all three being equivalents of his *V. palmata*, themselves represent three distinct violets; and the question was raised as to whether in cases like this the Linnæan specific name ought not to be abandoned altogether, seeing that he applied it to no species, but to a group of species, and that the name befits no one of the five or six better than the others. European botanists have frequently taken such a course in dealing with such groups of species which Linnæus had mixed together under one specific name so-called. The eighteen species of North American asters named, and more or less imperfectly published by Linnæus in 1753, were discussed as being in several instances indeterminable. Scarcely one out of the eighteen is adequately described, and the greater part of those which the most critical and careful specialist finds himself able to make out, he identifies, not from Linnæus, but from those pre-Linnæan authors whom Linnæus cites as having published fuller descriptions than his own, these often accompanied by plates or figures of the species. Since many hundreds of the Linnæan plant-species are only to be identified at second-hand, by help of the references which he is constantly making to Dodonæus, Ray, Morison, Dillenius, and other earlier authors, the real identification, by Linnæan name, of a host of our species, is accomplished by a study of those authors rather than by reading the short and often nearly useless diagnoses in those little volumes of the year 1753. The paper concluded in a note of warning to those of our younger botanists, who, while accomplishing much excellent phytographic work in the discrimination of species hitherto long confused, and publishing

excellent monographs as to knowledge of the plants, are evading the bibliographical difficulties, taking little or no care to ascertain whether the form which they publish for a new one be not in reality the old type, thus taking continual risk of adding to that nomenclatorial confusion which they are endeavoring to disentangle.

WILLIAM FAWCETT: *The botanic gardens of Jamaica.*

Mr. Fawcett expected to be present, but was unable to obtain leave of absence, and forwarded the paper, with lantern illustrations, to the president, Professor J. M. Coulter. Unfortunately the paper did not reach its destination, and it was therefore read by title only. The council had invited Drs. D. T. MacDougal and D. H. Campbell to address the society in connection with this paper, giving an account of their investigation this summer of Jamaica as a site for the proposed tropical laboratory.

Professor MacDougal discussed the physical features and climate of the island, while Professor Campbell summarized the botanical features. These accounts were listened to with greatest interest, and many questions were asked, which showed the eagerness with which American botanists are looking forward to the foundation of this laboratory. All the facts will be presented later when the other commissioners visit this and other islands in the course of the coming winter.

HERBERT J. WEBBER: *Researches upon Zamia.*

By invitation of the council, Mr. Herbert J. Webber addressed the society upon his recent researches upon *Zamia*, which have brought to light the remarkable results, some of which have already been published in this journal, and of which a complete account will appear herein later. Mr. Webber traced the development of the megaspore and microspore, the formation of the spermatozoids, their movements and union with the egg nucleus. He also called attention to the two forms of *Zamia* which he has observed, and showed cones of both sorts, which he thinks are entitled to separation, varietal, or possibly specific. The existence of these gigantic spermatozoids (visible

to the naked eye!) is almost incredible until one inspects Mr. Webber's preparations, which he exhibited later to members. The research not only shows many new points but opens collateral questions of great import. The exceptional interest attaching to these discoveries amply justifies the praise which Mr. Webber is receiving.